

SEQUENCE LISTING

<110> Sumitomo Chemical Co., Ltd.

<120> ANALYSIS OF AGONIST-ACTIVITY AND ANTAGONIST-ACTIVITY TO CYTOKININ RECEPTOR

<130> P152622

<160> 22

<170> PatentIn Ver. 2.1

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<211> 3531

<212> DNA

<213> Arabidopsis thaliana

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<221> CDS

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aag tcg tcg agc agt gac aag aaa tgg cta aag aag cct ctc ttc ttc 96

Lys Ser Ser Ser Asp Lys Lys Trp Leu Lys Lys Pro Leu Phe Phe

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ctg att ttg tgt ggc tct ttg gta att gtt ttg gtt atg ttc tta cg 144

Leu Ile Leu Cys Gly Ser Leu Val Ile Val Leu Val Met Phe Leu Arg

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tta ggt aga agt cag aag gag gag aca gat tct tgt aat gga gaa gag 192

Leu Gly Arg Ser Gln Lys Glu Glu Thr Asp Ser Cys Asn Gly Glu Glu

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aaa gtg ttg tat aga cat caa aat gtc aca aga agt gag att cat gat 240

Lys Val Leu Tyr Arg His Gln Asn Val Thr Arg Ser Glu Ile His Asp

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ttg gtc tct ttg ttc tct gat tca gat cag gta aca tcc ttt gaa tgt 288

Leu Val Ser Leu Phe Ser Asp Ser Asp Gln Val Thr Ser Phe Glu Cys

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cat aag gaa tca agc cct gga atg tgg aca aac tat ggt att aca tgt 336

His Lys Glu Ser Ser Pro Gly Met Trp Thr Asn Tyr Gly Ile Thr Cys

100 105 110

tcc ctg agt gtg cgt tct gat aaa caa gag act aga ggg ctt ccc tgg 384

Ser Leu Ser Val Arg Ser Asp Lys Gln Glu Thr Arg Gly Leu Pro Trp

115 120 125

aat ctt ggc tta gga cat tct atc tca tca aca tct tgt atg tgt ggt 432

Asn Leu Gly Leu Gly His Ser Ile Ser Ser Thr Ser Cys Met Cys Gly

130 135 140

aat ctt gaa ccg att tta cag caa cct gaa aac ctt gag gaa gaa aac 480

Asn Leu Glu Pro Ile Leu Gln Gln Pro Glu Asn Leu Glu Glu Glu Asn

145 150 155 160

cat gaa gaa ggg ctg gag cag ggt ttg tca tcg tat tta aga aat gca 528

His Glu Glu Gly Leu Glu Gln Gly Leu Ser Ser Tyr Leu Arg Asn Ala

165 170 175

tgg tgg tgt cta atc ctt ggt gtg tta gtg tgc cat aag att tat gta 576

Trp Trp Cys Leu Ile Leu Gly Val Leu Val Cys His Lys Ile Tyr Val  
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tct cat tct aaa gca cga ggt gag agg aaa gag aaa gta cat ctg caa 624

Ser His Ser Lys Ala Arg Gly Glu Arg Lys Glu Lys Val His Leu Gln  
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gag gct tta gct cca aag aag cag caa caa cgt gct cag act tct tct 672

Glu Ala Leu Ala Pro Lys Lys Gln Gln Gln Arg Ala Gln Thr Ser Ser  
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Arg Gly Ala Gly Arg Trp Arg Lys Asn Ile Leu Leu Leu Gly Ile Leu  
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gga gga gtt tcc ttc tct gtt tgg tgg ttt tgg gac act aat gag gag 768

Gly Gly Val Ser Phe Ser Val Trp Trp Phe Trp Asp Thr Asn Glu Glu  
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atc ata atg aaa agg agg gag act ttg gca aac atg tgt gac gaa cga 816

Ile Ile Met Lys Arg Arg Glu Thr Leu Ala Asn Met Cys Asp Glu Arg

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gca cgt gtt tta caa gat cag ttc aat gtt agc ttg aac cat gtt cat 864

Ala Arg Val Leu Gln Asp Gln Phe Asn Val Ser Leu Asn His Val His

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gcc ttg tct att ctt gta tct aca ttt cat cat ggt aaa atc cca tct 912

Ala Leu Ser Ile Leu Val Ser Thr Phe His His Gly Lys Ile Pro Ser

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gcc att gat cag aga aca ttt gaa gaa tat act gag aga aca aac ttt 960

Ala Ile Asp Gln Arg Thr Phe Glu Glu Tyr Thr Glu Arg Thr Asn Phe

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gag agg cca ctt act agt ggt gta gcg tat gct ttg aaa gtc cca cac 1008

Glu Arg Pro Leu Thr Ser Gly Val Ala Tyr Ala Leu Lys Val Pro His

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tca gaa aga gag aaa ttt gaa aag gag cat gga tgg gca ata aag aaa 1056

Ser Glu Arg Glu Lys Phe Glu Lys Glu His Gly Trp Ala Ile Lys Lys

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atg gaa act gag gac cag aca gtt gta caa gat tgt gtt cct gaa aac 1104

Met Glu Thr Glu Asp Gln Thr Val Val Gln Asp Cys Val Pro Glu Asn

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Phe Asp Pro Ala Pro Ile Gln Asp Glu Tyr Ala Pro Val Ile Phe Ala

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caa gaa act gtt tcc cat att gta tcg gtc gac atg atg tct gga gaa 1200

Gln Glu Thr Val Ser His Ile Val Ser Val Asp Met Met Ser Gly Glu

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gaa gac cgt gaa aac atc tta cgg gca agg gca tca gga aaa gga gtg 1248

Glu Asp Arg Glu Asn Ile Leu Arg Ala Arg Ala Ser Gly Lys Gly Val

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tta aca tct cca ttt aag ctt ctt aag tca aat cat ctt ggt gtt gtg 1296

Leu Thr Ser Pro Phe Lys Leu Leu Lys Ser Asn His Leu Gly Val Val

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ttg acc ttt gct gtc tat gac acg agc cta ccg cct gat gct aca gaa    1344

Leu Thr Phe Ala Val Tyr Asp Thr Ser Leu Pro Pro Asp Ala Thr Glu  
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gaa cag cgt gtt gaa gca act att ggg tac ctt ggt gca tca tat gat    1392

Glu Gln Arg Val Glu Ala Thr Ile Gly Tyr Leu Gly Ala Ser Tyr Asp  
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atg cca tcg ctg gtg gag aaa ctt ctt cac caa ctt gcc agc aaa cag    1440

Met Pro Ser Leu Val Glu Lys Leu Leu His Gln Leu Ala Ser Lys Gln  
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Thr Ile Ala Val Asp Val Tyr Asp Thr Thr Asn Thr Ser Gly Leu Ile  
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aaa atg tat ggc tca gaa att ggg gat ata agt gag cag cat ata agt    1536

Lys Met Tyr Gly Ser Glu Ile Gly Asp Ile Ser Glu Gln His Ile Ser  
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agc ctt gat ttt ggt gat cca tca agg aac cat gag atg cat tgc agg 1584

Ser Leu Asp Phe Gly Asp Pro Ser Arg Asn His Glu Met His Cys Arg

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Phe Lys His Lys Leu Pro Ile Pro Trp Thr Ala Ile Thr Pro Ser Ile

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tta gtt ctg gtt att act ttt ctt gtt ggt tat att tta tat gaa gcc 1680

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atc aac cga att gcg aca gtt gaa gag gat tgt cag aag atg agg gaa 1728

Ile Asn Arg Ile Ala Thr Val Glu Glu Asp Cys Gln Lys Met Arg Glu

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ctc aaa gct cgt gct gag gcc gct gac att gca aag tca cag ttc cta 1776

Leu Lys Ala Arg Ala Glu Ala Ala Asp Ile Ala Lys Ser Gln Phe Leu

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Met Leu Lys Met Leu Met Asp Thr Asp Leu Asp Ala Lys Gln Met Asp  
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Tyr Ala Gln Thr Ala His Gly Ser Gly Lys Asp Leu Thr Ser Leu Ile  
625 630 635 640  
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Leu Leu Ser Gly Lys Ala Asn Glu Lys Gly Ile Glu Leu Ala Val Tyr

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Val Ser Ser Gln Val Pro Asp Val Val Val Gly Asp Pro Ser Arg Phe

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cgg cag atc att aca aac ctg gtt gga aac tca atc aaa ttc aca cag 2160

Arg Gln Ile Ile Thr Asn Leu Val Gly Asn Ser Ile Lys Phe Thr Gln

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Glu Arg Gly His Ile Phe Ile Ser Val His Leu Ala Asp Glu Val Lys

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gca tgg gga agc tgg aag aat ttc aag aca tgt tac agt act gag agt 2352

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Val Gly Ile Pro Val Asp Ala Gln Gly Arg Ile Phe Thr Pro Phe Met

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Phe Gly Lys Ala Glu Thr Asn Thr Ser Ile Thr Lys Leu Glu Arg Phe

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Gly Ile Ser Ala Asp Ile Val Ser Ser Leu Arg Met Ala Cys Thr Cys

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Cys Ile Ser Lys Leu Glu Asn Leu Ala Met Ile Leu Ile Asp Lys Asp  
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gcc tgg aac aag gaa gaa ttt tca gta ctt gac gag ttg ttt acc cga 2880

Ala Trp Asn Lys Glu Glu Phe Ser Val Leu Asp Glu Leu Phe Thr Arg  
945 950 955 960

agc aaa gta acc ttt aca aga gtc cca aag att ttt ctt ttg gca act 2928

Ser Lys Val Thr Phe Thr Arg Val Pro Lys Ile Phe Leu Leu Ala Thr  
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tct gca act ctt act gag cgc agt gag atg aag tct act ggt ctc atc 2976

Ser Ala Thr Leu Thr Glu Arg Ser Glu Met Lys Ser Thr Gly Leu Ile  
980 985 990

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Asp Glu Val Val Ile Lys Pro Leu Arg Met Ser Val Leu Ile Cys Cys  
995 1000 1005

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1010 1015 1020

cga aga aat ctt gga cac ttg cta aga gaa aaa cag att ctg gtt gtg 3120

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Asp Asp Asn Leu Val Asn Arg Arg Val Ala Glu Gly Ala Leu Lys Lys

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tat gga gct att gtt aca tgc gtt gag agt ggc aaa gct gca ttg gca 3216

Tyr Gly Ala Ile Val Thr Cys Val Glu Ser Gly Lys Ala Ala Leu Ala

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atg ctt aag ccg cct cat aac ttc gat gct tgc ttc atg gat ctc cag 3264

Met Leu Lys Pro Pro His Asn Phe Asp Ala Cys Phe Met Asp Leu Gln

1075 1080 1085

atg cct gaa atg gat gga ttt gaa gcg aca agg aga gtc cgt gag ctg 3312

Met Pro Glu Met Asp Gly Phe Glu Ala Thr Arg Arg Val Arg Glu Leu  
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gag agg gaa atc aat aag aaa ata gct tct gga gaa gtt tca gct gaa    3360

Glu Arg Glu Ile Asn Lys Lys Ile Ala Ser Gly Glu Val Ser Ala Glu  
1105                    1110                    1115                    1120

atg ttc tgt aaa ttt agt agt tgg cac gtc ccg ata tta gca atg aca    3408

Met Phe Cys Lys Phe Ser Ser Trp His Val Pro Ile Leu Ala Met Thr  
1125                    1130                    1135

gca gat gtt att cag gct act cat gaa gaa tgc atg aaa tgt gga atg    3456

Ala Asp Val Ile Gln Ala Thr His Glu Glu Cys Met Lys Cys Gly Met  
1140                    1145                    1150

gat ggt tat gta tca aaa ccg ttt gaa gag gaa gtg ctc tac aca gcg    3504

Asp Gly Tyr Val Ser Lys Pro Phe Glu Glu Val Leu Tyr Thr Ala  
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25

30

Leu Ile Leu Cys Gly Ser Leu Val Ile Val Leu Val Met Phe Leu Arg

35

40

45

Leu Gly Arg Ser Gln Lys Glu Glu Thr Asp Ser Cys Asn Gly Glu Glu

50

55

60

Lys Val Leu Tyr Arg His Gln Asn Val Thr Arg Ser Glu Ile His Asp

65

70

75

80

Leu Val Ser Leu Phe Ser Asp Ser Asp Gln Val Thr Ser Phe Glu Cys

85

90

95

His Lys Glu Ser Ser Pro Gly Met Trp Thr Asn Tyr Gly Ile Thr Cys

100

105

110

Ser Leu Ser Val Arg Ser Asp Lys Gln Glu Thr Arg Gly Leu Pro Trp

115

120

125

Asn Leu Gly Leu Gly His Ser Ile Ser Ser Thr Ser Cys Met Cys Gly  
130 135 140

Asn Leu Glu Pro Ile Leu Gln Gln Pro Glu Asn Leu Glu Glu Glu Asn  
145 150 155 160

His Glu Glu Gly Leu Glu Gln Gly Leu Ser Ser Tyr Leu Arg Asn Ala  
165 170 175

Trp Trp Cys Leu Ile Leu Gly Val Leu Val Cys His Lys Ile Tyr Val  
180 185 190

Ser His Ser Lys Ala Arg Gly Glu Arg Lys Glu Lys Val His Leu Gln  
195 200 205

Glu Ala Leu Ala Pro Lys Lys Gln Gln Gln Arg Ala Gln Thr Ser Ser  
210 215 220

Arg Gly Ala Gly Arg Trp Arg Lys Asn Ile Leu Leu Leu Gly Ile Leu  
225 230 235 240

Gly Gly Val Ser Phe Ser Val Trp Trp Phe Trp Asp Thr Asn Glu Glu  
245 250 255

Ile Ile Met Lys Arg Arg Glu Thr Leu Ala Asn Met Cys Asp Glu Arg  
260 265 270

Ala Arg Val Leu Gln Asp Gln Phe Asn Val Ser Leu Asn His Val His  
275 280 285

Ala Leu Ser Ile Leu Val Ser Thr Phe His His Gly Lys Ile Pro Ser  
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Ala Ile Asp Gln Arg Thr Phe Glu Glu Tyr Thr Glu Arg Thr Asn Phe  
305 310 315 320

Glu Arg Pro Leu Thr Ser Gly Val Ala Tyr Ala Leu Lys Val Pro His  
325 330 335

Ser Glu Arg Glu Lys Phe Glu Lys Glu His Gly Trp Ala Ile Lys Lys  
340 345 350

Met Glu Thr Glu Asp Gln Thr Val Val Gln Asp Cys Val Pro Glu Asn  
355 360 365

Phe Asp Pro Ala Pro Ile Gln Asp Glu Tyr Ala Pro Val Ile Phe Ala  
370 375 380

Gln Glu Thr Val Ser His Ile Val Ser Val Asp Met Met Ser Gly Glu  
385 390 395 400

Glu Asp Arg Glu Asn Ile Leu Arg Ala Arg Ala Ser Gly Lys Gly Val  
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Leu Thr Ser Pro Phe Lys Leu Leu Lys Ser Asn His Leu Gly Val Val  
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Leu Thr Phe Ala Val Tyr Asp Thr Ser Leu Pro Pro Asp Ala Thr Glu  
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Glu Gln Arg Val Glu Ala Thr Ile Gly Tyr Leu Gly Ala Ser Tyr Asp  
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Met Pro Ser Leu Val Glu Lys Leu Leu His Gln Leu Ala Ser Lys Gln  
465 470 475 480

Thr Ile Ala Val Asp Val Tyr Asp Thr Thr Asn Thr Ser Gly Leu Ile  
485 490 495

Lys Met Tyr Gly Ser Glu Ile Gly Asp Ile Ser Glu Gln His Ile Ser  
500 505 510

Ser Leu Asp Phe Gly Asp Pro Ser Arg Asn His Glu Met His Cys Arg  
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Phe Lys His Lys Leu Pro Ile Pro Trp Thr Ala Ile Thr Pro Ser Ile  
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Leu Val Leu Val Ile Thr Phe Leu Val Gly Tyr Ile Leu Tyr Glu Ala  
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Ala Thr Val Ser His Glu Ile Arg Thr Pro Met Asn Gly Val Leu Gly  
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Met Leu Lys Met Leu Met Asp Thr Asp Leu Asp Ala Lys Gln Met Asp  
610 615 620  
Tyr Ala Gln Thr Ala His Gly Ser Gly Lys Asp Leu Thr Ser Leu Ile  
625 630 635 640  
Asn Glu Val Leu Asp Gln Ala Lys Ile Glu Ser Gly Arg Leu Glu Leu  
645 650 655  
Glu Asn Val Pro Phe Asp Met Arg Phe Ile Leu Asp Asn Val Ser Ser  
660 665 670  
Leu Leu Ser Gly Lys Ala Asn Glu Lys Gly Ile Glu Leu Ala Val Tyr  
675 680 685  
Val Ser Ser Gln Val Pro Asp Val Val Val Gly Asp Pro Ser Arg Phe  
690 695 700  
Arg Gln Ile Ile Thr Asn Leu Val Gly Asn Ser Ile Lys Phe Thr Gln  
705 710 715 720  
Glu Arg Gly His Ile Phe Ile Ser Val His Leu Ala Asp Glu Val Lys  
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Gly Cys Ser Glu Ser Gly Glu Thr Val Ser Gly Phe Pro Ala Val Asn  
755 760 765  
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Ser Lys Val Thr Phe Thr Arg Val Pro Lys Ile Phe Leu Leu Ala Thr  
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Phe Trp Met Leu Cys Cys Trp Phe Val Ser Trp Phe Val Asp Asn Gly

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atc gag gac aag tct ggt ctt tta gtt ggc tct gtc ggt gat ctt gag    144

Ile Glu Asp Lys Ser Gly Leu Leu Val Gly Ser Val Gly Asp Leu Glu  
35 40 45

aag act aag atg act acg ttg aag aag aag aac aag atg tgg ttc tgg 192

Lys Thr Lys Met Thr Thr Leu Lys Lys Lys Asn Lys Met Trp Phe Trp  
50 55 60

aat aag atc tct agc agc gga ctc aag atc ccg agt ttc tct tat cag 240

Asn Lys Ile Ser Ser Ser Gly Leu Lys Ile Pro Ser Phe Ser Tyr Gln  
65 70 75 80

ttt ctt ggc tct gtt aaa ttc aac aag gcg tgg tgg agg aag ctt gtg 288

Phe Leu Gly Ser Val Lys Phe Asn Lys Ala Trp Trp Arg Lys Leu Val  
85 90 95

gtg gtt tgg gtt gtc ttc tgg gtc ttg gtc tct att tgg acg ttt tgg 336

Val Val Trp Val Val Phe Trp Val Leu Val Ser Ile Trp Thr Phe Trp  
100 105 110

tac ttt agc tcg caa gct atg gag aag agg aaa gag acg cta gct agt 384

Tyr Phe Ser Ser Gln Ala Met Glu Lys Arg Lys Glu Thr Leu Ala Ser

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Met Cys Asp Glu Arg Ala Arg Met Leu Gln Asp Gln Phe Asn Val Ser

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ggc aag att cct tct gct atc gat cag aga aca ttc tca gag tac act 528

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gat aga act tcc ttt gag agg cct ctt act agc ggg gta gct tat gct 576

Asp Arg Thr Ser Phe Glu Arg Pro Leu Thr Ser Gly Val Ala Tyr Ala

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atg agg gtg ctc cat tca gag agg gaa gag ttc gag agg caa caa ggt 624

Met Arg Val Leu His Ser Glu Arg Glu Glu Phe Glu Arg Gln Gln Gly

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205

tgg act att agg aag atg tat tct ctt gaa caa aac cca gtt cac aag 672

Trp Thr Ile Arg Lys Met Tyr Ser Leu Glu Gln Asn Pro Val His Lys

210

215

220

gat gac tat gac ctg gaa gct ttg gaa cca tcc cct gtc caa gaa gag 720

Asp Asp Tyr Asp Leu Glu Ala Leu Glu Pro Ser Pro Val Gln Glu Glu

225

230

235

240

tac gct cca gtc atc ttt gct cag gac act gtt tct cac gtt gtt tct 768

Tyr Ala Pro Val Ile Phe Ala Gln Asp Thr Val Ser His Val Val Ser

245

250

255

ctc gat atg ctg tct ggg aaa gaa gat cgt gaa aac gtt ttg cggt gcc 816

Leu Asp Met Leu Ser Gly Lys Glu Asp Arg Glu Asn Val Leu Arg Ala

260

265

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agg agt tca ggt aaa ggg gtt ttg aca gct cct ttc cca ttg ata aag 864

Arg Ser Ser Gly Lys Gly Val Leu Thr Ala Pro Phe Pro Leu Ile Lys

275

280

285

aca aat aga ctt ggg gtg atc ctg aca ttt gca gtg tac aag aga gat 912  
Thr Asn Arg Leu Gly Val Ile Leu Thr Phe Ala Val Tyr Lys Arg Asp  
290 295 300  
ctc ccc tcc aat gca acg cca aaa gag aga att gag gct act aac ggg 960  
Leu Pro Ser Asn Ala Thr Pro Lys Glu Arg Ile Glu Ala Thr Asn Gly  
305 310 315 320  
tat ctc ggg gga gtg ttt gac att gag tcc ctg gta gaa aac ttg ctt 1008  
Tyr Leu Gly Gly Val Phe Asp Ile Glu Ser Leu Val Glu Asn Leu Leu  
325 330 335  
caa cag ctg gct agc aag caa acg att ctt gtc aat gtg tac gat atc 1056  
Gln Gln Leu Ala Ser Lys Gln Thr Ile Leu Val Asn Val Tyr Asp Ile  
340 345 350  
acc aat cac tct caa ccg att agc atg tat ggt aca aat gtg tcg gct 1104  
Thr Asn His Ser Gln Pro Ile Ser Met Tyr Gly Thr Asn Val Ser Ala  
355 360 365

gat ggg ttg gaa cgt gtt agt cca cta atc ttt ggc gat cca ttg aga 1152

Asp Gly Leu Glu Arg Val Ser Pro Leu Ile Phe Gly Asp Pro Leu Arg  
370 375 380

aag cat gag atg cgt tgc aga ttt aag cag aaa cca cca tgg cca gtg 1200

Lys His Glu Met Arg Cys Arg Phe Lys Gln Lys Pro Pro Trp Pro Val  
385 390 395 400

cta tca atg gtg aca tca ttc ggt atc ctt gtg att gcg tta ctt gtt 1248

Leu Ser Met Val Thr Ser Phe Gly Ile Leu Val Ile Ala Leu Leu Val  
405 410 415

gca cat ata atc cac gca acc gtt agt cga ata cac aaa gtt gaa gaa 1296

Ala His Ile Ile His Ala Thr Val Ser Arg Ile His Lys Val Glu Glu  
420 425 430

gat tgt gat aaa atg aag cag ctc aag aaa aag gct gaa gca gca gat 1344

Asp Cys Asp Lys Met Lys Gln Leu Lys Lys Ala Glu Ala Ala Asp  
435 440 445

gtt gca aag tca cag ttc ctt gcc act gtt tca cat gaa atc aga act 1392

Val Ala Lys Ser Gln Phe Leu Ala Thr Val Ser His Glu Ile Arg Thr  
450 455 460

cca atg aat ggt gtt cta gga atg ttg cat atg ctt atg gac aca gag 1440

Pro Met Asn Gly Val Leu Gly Met Leu His Met Leu Met Asp Thr Glu  
465 470 475 480

tta gat gtt acg caa cag gat tat gtt agg acc gca cag gca agt gga 1488

Leu Asp Val Thr Gln Gln Asp Tyr Val Arg Thr Ala Gln Ala Ser Gly  
485 490 495

aaa gct tta gtc tcg cta ata aat gag gtt ttg gac caa gca aag att 1536

Lys Ala Leu Val Ser Leu Ile Asn Glu Val Leu Asp Gln Ala Lys Ile  
500 505 510

gaa tct gga aag ctt gaa ctt gag gag gtg cgg ttt gat ttg aga gga 1584

Glu Ser Gly Lys Leu Glu Leu Glu Val Arg Phe Asp Leu Arg Gly  
515 520 525

ata tta gat gat gtc ctg tca ctc ttc tct agc aag tcc caa caa aag 1632

Ile Leu Asp Asp Val Leu Ser Leu Phe Ser Ser Lys Ser Gln Gln Lys  
530 535 540

ggg gtg gag ttg gca gta tac ata tct gat cgt gtt cca gat atg tta 1680

Gly Val Glu Leu Ala Val Tyr Ile Ser Asp Arg Val Pro Asp Met Leu  
545 550 555 560

att ggt gat cct ggg agg ttt cga caa ata ctc aca aat ctt atg ggt 1728

Ile Gly Asp Pro Gly Arg Phe Arg Gln Ile Leu Thr Asn Leu Met Gly  
565 570 575

aat tcc att aag ttc act gag aaa gga cac atc ttt gta act gtt cat 1776

Asn Ser Ile Lys Phe Thr Glu Lys Gly His Ile Phe Val Thr Val His  
580 585 590

ttg gtg gat gag cta ttt gaa tct atc gat gga gag aca gca tca tct 1824

Leu Val Asp Glu Leu Phe Glu Ser Ile Asp Gly Glu Thr Ala Ser Ser  
595 600 605

ccg gaa agt aca ctg agt ggg ctt cca gtt gca gac cg<sub>g</sub> cag agg agc 1872

Pro Glu Ser Thr Leu Ser Gly Leu Pro Val Ala Asp Arg Gln Arg Ser

610

615

620

tgg gaa aac ttt aaa gct ttc agc tcc aac ggg cat cgg agc ttt gaa 1920

Trp Glu Asn Phe Lys Ala Phe Ser Ser Asn Gly His Arg Ser Phe Glu

625

630

635

640

cca tct ccc cct gat ata aac cta atc gtc tca gtt gag gat act ggc 1968

Pro Ser Pro Pro Asp Ile Asn Leu Ile Val Ser Val Glu Asp Thr Gly

645

650

655

gta ggg atc cct gta gaa gcg cag tcc cgt att ttt acg cct ttc atg 2016

Val Gly Ile Pro Val Glu Ala Gln Ser Arg Ile Phe Thr Pro Phe Met

660

665

670

caa gtc gga cca tcc ata tcc agg acg cat gga ggc aca gga att gga 2064

Gln Val Gly Pro Ser Ile Ser Arg Thr His Gly Gly Thr Gly Ile Gly

675

680

685

ctt agc ata agc aaa tgt cta gtt gga ctg atg aag gga gaa att gga 2112

Leu Ser Ile Ser Lys Cys Leu Val Gly Leu Met Lys Gly Glu Ile Gly

690

695

700

ttc tcg agt act ccc aag gtt ggg tcc aca ttc aca ttt act gct gta 2160

Phe Ser Ser Thr Pro Lys Val Gly Ser Thr Phe Thr Phe Thr Ala Val  
705 710 715 720

ttt tcc aat ggg atg caa cca gct gaa aga aag aat gac aac aac cag 2208

Phe Ser Asn Gly Met Gln Pro Ala Glu Arg Lys Asn Asp Asn Asn Gln  
725 730 735

ccc ata ttc tcg gaa ttc cgg ggc atg aaa gct gtg gtt gtg gac cat 2256

Pro Ile Phe Ser Glu Phe Arg Gly Met Lys Ala Val Val Val Asp His  
740 745 750

agg cct gca agg gca aaa gtc tcg tgg tac cat ttt cag cgt ctt gga 2304

Arg Pro Ala Arg Ala Lys Val Ser Trp Tyr His Phe Gln Arg Leu Gly  
755 760 765

att cga gtc gaa gta gtt cca cgt gtt gaa cag cgt gct cta cat tat ctg 2352

Ile Arg Val Glu Val Val Pro Arg Val Glu Gln Ala Leu His Tyr Leu  
770 775 780

aag att ggt act acc act gtg aat atg ata ctc ata gag caa gaa ata 2400  
Lys Ile Gly Thr Thr Val Asn Met Ile Leu Ile Glu Gln Glu Ile  
785 790 795 800

tgg aat agg gaa gca gat gat ttc att aaa aag cta cag aaa gac cct 2448  
Trp Asn Arg Glu Ala Asp Asp Phe Ile Lys Lys Leu Gln Lys Asp Pro  
805 810 815

ctt ttc ctt tct cct aag ttg att ttg tta gca aac tca gta gaa tcg 2496  
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820 825 830

tca ata tca gag gct tta tgc acc ggt ata gat cct cca ata gtg ata 2544  
Ser Ile Ser Glu Ala Leu Cys Thr Gly Ile Asp Pro Pro Ile Val Ile  
835 840 845

gtg aaa cca ttg agg gcg agt atg cta gca gca act ttg cag agg gga 2592  
Val Lys Pro Leu Arg Ala Ser Met Leu Ala Ala Thr Leu Gln Arg Gly  
850 855 860

ttg ggt att gga atc aga gaa cca cct caa cac aag gga cct cct gct 2640

Leu Gly Ile Gly Ile Arg Glu Pro Pro Gln His Lys Gly Pro Pro Ala  
865                    870                    875                    880

ttg att ctc agg aat ctt ctc ctt ggt aga aaa att tta atc gtg gat    2688

Leu Ile Leu Arg Asn Leu Leu Leu Gly Arg Lys Ile Leu Ile Val Asp  
885                    890                    895

gat aac aac gta aac ctc aga gtg gca gcg gga gct ctg aaa aag tac    2736

Asp Asn Asn Val Asn Leu Arg Val Ala Ala Gly Ala Leu Lys Lys Tyr  
900                    905                    910

gga gct gat gtg gtc tgc gct gag agt ggg ata aag gca atc tca ttg    2784

Gly Ala Asp Val Val Cys Ala Glu Ser Gly Ile Lys Ala Ile Ser Leu  
915                    920                    925

ctt aag cca cct cac gag ttt gat gct tgc ttc atg gac att cag atg    2832

Leu Lys Pro Pro His Glu Phe Asp Ala Cys Phe Met Asp Ile Gln Met  
930                    935                    940

cca gaa atg gat gga ttt gaa gct aca agg aga ata cga gat atg gaa    2880

Pro Glu Met Asp Gly Phe Glu Ala Thr Arg Arg Ile Arg Asp Met Glu  
945                    950                    955                    960

gag gag atg aac aac aag aga ata aag aat ggg gag gct ttt ata gta gag    2928

Glu Glu Met Asn Lys Arg Ile Lys Asn Gly Glu Ala Leu Ile Val Glu  
965                    970                    975

aac ggt aac aaa aca acg tgg cat ctt ccg gta tta gca atg acg gca    2976

Asn Gly Asn Lys Thr Ser Trp His Leu Pro Val Leu Ala Met Thr Ala  
980                    985                    990

gat gtg atc caa gca acg cat gag gaa tgt ctg aag tgt gga atg gat    3024

Asp Val Ile Gln Ala Thr His Glu Glu Cys Leu Lys Cys Gly Met Asp  
995                    1000                    1005

ggg tat gta tca aaa cca ttt gaa gca gag cag ctg tac agg gaa gtt    3072

Gly Tyr Val Ser Lys Pro Phe Glu Ala Glu Gln Leu Tyr Arg Glu Val  
1010                  1015                  1020

tct cgc ttt ttc aat tcg cct tca gat aca gaa tca taa                  3111

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1035

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Ile Glu Asp Lys Ser Gly Leu Leu Val Gly Ser Val Gly Asp Leu Glu  
35 40 45  
Lys Thr Lys Met Thr Thr Leu Lys Lys Asn Lys Met Trp Phe Trp  
50 55 60  
Asn Lys Ile Ser Ser Ser Gly Leu Lys Ile Pro Ser Phe Ser Tyr Gln  
65 70 75 80  
Phe Leu Gly Ser Val Lys Phe Asn Lys Ala Trp Trp Arg Lys Leu Val  
85 90 95  
Val Val Trp Val Val Phe Trp Val Leu Val Ser Ile Trp Thr Phe Trp  
100 105 110  
Tyr Phe Ser Ser Gln Ala Met Glu Lys Arg Lys Glu Thr Leu Ala Ser  
115 120 125  
Met Cys Asp Glu Arg Ala Arg Met Leu Gln Asp Gln Phe Asn Val Ser

130                    135                    140  
Met Asn His Val Gln Ala Met Ser Ile Leu Ile Ser Thr Phe His His  
145                    150                    155                    160  
Gly Lys Ile Pro Ser Ala Ile Asp Gln Arg Thr Phe Ser Glu Tyr Thr  
165                    170                    175  
Asp Arg Thr Ser Phe Glu Arg Pro Leu Thr Ser Gly Val Ala Tyr Ala  
180                    185                    190  
Met Arg Val Leu His Ser Glu Arg Glu Glu Phe Glu Arg Gln Gln Gly  
195                    200                    205  
Trp Thr Ile Arg Lys Met Tyr Ser Leu Glu Gln Asn Pro Val His Lys  
210                    215                    220  
Asp Asp Tyr Asp Leu Glu Ala Leu Glu Pro Ser Pro Val Gln Glu Glu  
225                    230                    235                    240  
Tyr Ala Pro Val Ile Phe Ala Gln Asp Thr Val Ser His Val Val Ser  
245                    250                    255  
Leu Asp Met Leu Ser Gly Lys Glu Asp Arg Glu Asn Val Leu Arg Ala  
260                    265                    270  
Arg Ser Ser Gly Lys Gly Val Leu Thr Ala Pro Phe Pro Leu Ile Lys  
275                    280                    285  
Thr Asn Arg Leu Gly Val Ile Leu Thr Phe Ala Val Tyr Lys Arg Asp  
290                    295                    300  
Leu Pro Ser Asn Ala Thr Pro Lys Glu Arg Ile Glu Ala Thr Asn Gly  
305                    310                    315                    320  
Tyr Leu Gly Gly Val Phe Asp Ile Glu Ser Leu Val Glu Asn Leu Leu  
325                    330                    335  
Gln Gln Leu Ala Ser Lys Gln Thr Ile Leu Val Asn Val Tyr Asp Ile

340                    345                    350  
Thr Asn His Ser Gln Pro Ile Ser Met Tyr Gly Thr Asn Val Ser Ala  
355                    360                    365  
Asp Gly Leu Glu Arg Val Ser Pro Leu Ile Phe Gly Asp Pro Leu Arg  
370                    375                    380  
Lys His Glu Met Arg Cys Arg Phe Lys Gln Lys Pro Pro Trp Pro Val  
385                    390                    395                    400  
Leu Ser Met Val Thr Ser Phe Gly Ile Leu Val Ile Ala Leu Leu Val  
405                    410                    415  
Ala His Ile Ile His Ala Thr Val Ser Arg Ile His Lys Val Glu Glu  
420                    425                    430  
Asp Cys Asp Lys Met Lys Gln Leu Lys Lys Lys Ala Glu Ala Ala Asp  
435                    440                    445  
Val Ala Lys Ser Gln Phe Leu Ala Thr Val Ser His Glu Ile Arg Thr  
450                    455                    460  
Pro Met Asn Gly Val Leu Gly Met Leu His Met Leu Met Asp Thr Glu  
465                    470                    475                    480  
Leu Asp Val Thr Gln Gln Asp Tyr Val Arg Thr Ala Gln Ala Ser Gly  
485                    490                    495  
Lys Ala Leu Val Ser Leu Ile Asn Glu Val Leu Asp Gln Ala Lys Ile  
500                    505                    510  
Glu Ser Gly Lys Leu Glu Leu Glu Glu Val Arg Phe Asp Leu Arg Gly  
515                    520                    525  
Ile Leu Asp Asp Val Leu Ser Leu Phe Ser Ser Lys Ser Gln Gln Lys  
530                    535                    540  
Gly Val Glu Leu Ala Val Tyr Ile Ser Asp Arg Val Pro Asp Met Leu

545                    550                    555                    560  
Ile Gly Asp Pro Gly Arg Phe Arg Gln Ile Leu Thr Asn Leu Met Gly  
565                    570                    575  
Asn Ser Ile Lys Phe Thr Glu Lys Gly His Ile Phe Val Thr Val His  
580                    585                    590  
Leu Val Asp Glu Leu Phe Glu Ser Ile Asp Gly Glu Thr Ala Ser Ser  
595                    600                    605  
Pro Glu Ser Thr Leu Ser Gly Leu Pro Val Ala Asp Arg Gln Arg Ser  
610                    615                    620  
Trp Glu Asn Phe Lys Ala Phe Ser Ser Asn Gly His Arg Ser Phe Glu  
625                    630                    635                    640  
Pro Ser Pro Pro Asp Ile Asn Leu Ile Val Ser Val Glu Asp Thr Gly  
645                    650                    655  
Val Gly Ile Pro Val Glu Ala Gln Ser Arg Ile Phe Thr Pro Phe Met  
660                    665                    670  
Gln Val Gly Pro Ser Ile Ser Arg Thr His Gly Gly Thr Gly Ile Gly  
675                    680                    685  
Leu Ser Ile Ser Lys Cys Leu Val Gly Leu Met Lys Gly Glu Ile Gly  
690                    695                    700  
Phe Ser Ser Thr Pro Lys Val Gly Ser Thr Phe Thr Phe Thr Ala Val  
705                    710                    715                    720  
Phe Ser Asn Gly Met Gln Pro Ala Glu Arg Lys Asn Asp Asn Asn Gln  
725                    730                    735  
Pro Ile Phe Ser Glu Phe Arg Gly Met Lys Ala Val Val Val Asp His  
740                    745                    750  
Arg Pro Ala Arg Ala Lys Val Ser Trp Tyr His Phe Gln Arg Leu Gly

755                    760                    765

Ile Arg Val Glu Val Val Pro Arg Val Glu Gln Ala Leu His Tyr Leu  
770                    775                    780

Lys Ile Gly Thr Thr Thr Val Asn Met Ile Leu Ile Glu Gln Glu Ile  
785                    790                    795                    800

Trp Asn Arg Glu Ala Asp Asp Phe Ile Lys Lys Leu Gln Lys Asp Pro  
805                    810                    815

Leu Phe Leu Ser Pro Lys Leu Ile Leu Leu Ala Asn Ser Val Glu Ser  
820                    825                    830

Ser Ile Ser Glu Ala Leu Cys Thr Gly Ile Asp Pro Pro Ile Val Ile  
835                    840                    845

Val Lys Pro Leu Arg Ala Ser Met Leu Ala Ala Thr Leu Gln Arg Gly  
850                    855                    860

Leu Gly Ile Gly Ile Arg Glu Pro Pro Gln His Lys Gly Pro Pro Ala  
865                    870                    875                    880

Leu Ile Leu Arg Asn Leu Leu Leu Gly Arg Lys Ile Leu Ile Val Asp  
885                    890                    895

Asp Asn Asn Val Asn Leu Arg Val Ala Ala Gly Ala Leu Lys Lys Tyr  
900                    905                    910

Gly Ala Asp Val Val Cys Ala Glu Ser Gly Ile Lys Ala Ile Ser Leu  
915                    920                    925

Leu Lys Pro Pro His Glu Phe Asp Ala Cys Phe Met Asp Ile Gln Met  
930                    935                    940

Pro Glu Met Asp Gly Phe Glu Ala Thr Arg Arg Ile Arg Asp Met Glu  
945                    950                    955                    960

Glu Glu Met Asn Lys Arg Ile Lys Asn Gly Glu Ala Leu Ile Val Glu

965                    970                    975  
Asn Gly Asn Lys Thr Ser Trp His Leu Pro Val Leu Ala Met Thr Ala  
980                    985                    990  
Asp Val Ile Gln Ala Thr His Glu Glu Cys Leu Lys Cys Gly Met Asp  
995                    1000                    1005  
Gly Tyr Val Ser Lys Pro Phe Glu Ala Glu Gln Leu Tyr Arg Glu Val  
1010                    1015                    1020  
Ser Arg Phe Asn Ser Pro Ser Asp Thr Glu Ser  
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aga att gaa att tct gat tcc gag tca cta gaa aac ttg aaa agc agc 96

Arg Ile Glu Ile Ser Asp Ser Glu Ser Leu Glu Asn Leu Lys Ser Ser

20

25

30

gat ttt tat caa ctg ggt ggt ggt gct ctg aat tcg tca gaa aag 144

Asp Phe Tyr Gln Leu Gly Gly Gly Ala Leu Asn Ser Ser Glu Lys

35

40

45

ccg aga aag atc gat ttt tgg cgt tcg ggg ttg atg ggt ttt gcg aag 192

Pro Arg Lys Ile Asp Phe Trp Arg Ser Gly Leu Met Gly Phe Ala Lys

50

55

60

atg cag cag cag caa cag ctt cag cat tca gtg gcg gtg aag atg aac 240

Met Gln Gln Gln Gln Gln Leu Gln His Ser Val Ala Val Lys Met Asn

65

70

75

80

aat aat aat aat aac gat cta atg ggt aat aaa aaa ggg tca act ttc 288

Asn Asn Asn Asn Asn Asp Leu Met Gly Asn Lys Lys Gly Ser Thr Phe

85

90

95

ata caa gaa cat cga gca ttg tta cca aaa gct ttg att ctg tgg atc 336

Ile Gln Glu His Arg Ala Leu Leu Pro Lys Ala Leu Ile Leu Trp Ile

100 105

110

atc att gtt ggg ttt ata agc agt ggg att tat cag tgg atg gat gat 384

Ile Ile Val Gly Phe Ile Ser Ser Gly Ile Tyr Gln Trp Met Asp Asp

115 120

125

gct aat aag att aga agg gaa gag gtt ttg gtc agc atg tgt gat caa 432

Ala Asn Lys Ile Arg Arg Glu Glu Val Leu Val Ser Met Cys Asp Gln

130 135 140

aga gct aga atg ttg cag gat caa ttt agt gtt agt gtt aat cat gtt 480

Arg Ala Arg Met Leu Gln Asp Gln Phe Ser Val Ser Val Asn His Val

145 150 155 160

cat gct ttg gct att ctc gtc tcc act ttt cat tac cac aag aac cct 528

His Ala Leu Ala Ile Leu Val Ser Thr Phe His Tyr His Lys Asn Pro

165 170 175

tct gca att gat cag gag aca ttt gcg gag tac acg gca aga aca gca 576

Ser Ala Ile Asp Gln Glu Thr Phe Ala Glu Tyr Thr Ala Arg Thr Ala

180

185

190

ttt gag aga ccg ttg cta agt gga gtg gct tat gct gaa aaa gtt gtg 624

Phe Glu Arg Pro Leu Leu Ser Gly Val Ala Tyr Ala Glu Lys Val Val

195

200

205

aat ttt gag agg gag atg ttt gag cgg cag cac aat tgg gtt ata aag 672

Asn Phe Glu Arg Glu Met Phe Glu Arg Gln His Asn Trp Val Ile Lys

210

215

220

aca atg gat aga gga gag cct tca ccg gtt agg gat gag tat gct cct 720

Thr Met Asp Arg Gly Glu Pro Ser Pro Val Arg Asp Glu Tyr Ala Pro

225

230

235

240

gtt ata ttc tct caa gat agt gtc tct tac ctt gag tca ctc gat atg 768

Val Ile Phe Ser Gln Asp Ser Val Ser Tyr Leu Glu Ser Leu Asp Met

245

250

255

atg tca ggc gag gag gat cgt gag aat att ttg cga gct aga gaa acc 816

Met Ser Gly Glu Glu Asp Arg Glu Asn Ile Leu Arg Ala Arg Glu Thr

260

265

270

gga aaa gct gtc ttg act agc cct ttt agg ttg ttg gaa act cac cat 864

Gly Lys Ala Val Leu Thr Ser Pro Phe Arg Leu Leu Glu Thr His His

275

280

285

ctc gga gtt gtg ttg aca ttc cct gtc tac aag tct tct ctt cct gaa 912

Leu Gly Val Val Leu Thr Phe Pro Val Tyr Lys Ser Ser Leu Pro Glu

290

295

300

aat ccg act gtc gaa gag cgt att gca gcc act gca ggg tac ctt ggt 960

Asn Pro Thr Val Glu Glu Arg Ile Ala Ala Thr Ala Gly Tyr Leu Gly

305

310

315

320

ggt gcg ttt gat gtg gag tct cta gtc gag aat tta ctt ggt cag ctt 1008

Gly Ala Phe Asp Val Glu Ser Leu Val Glu Asn Leu Leu Gly Gln Leu

325

330

335

gct ggt aac caa gca ata gtt gtg cat gtg tat gat atc acc aat gca 1056

Ala Gly Asn Gln Ala Ile Val Val His Val Tyr Asp Ile Thr Asn Ala

340                    345                    350  
tca gat cca ctt gtc atg tat ggt aat caa gat gaa gaa gcc gac aga    1104  
Ser Asp Pro Leu Val Met Tyr Gly Asn Gln Asp Glu Glu Ala Asp Arg  
355                    360                    365  
tct ctc tct cat gag agc aag ctc gat ttt gga gac ccc ttc agg aaa    1152  
Ser Leu Ser His Glu Ser Lys Leu Asp Phe Gly Asp Pro Phe Arg Lys  
370                    375                    380  
cat aag atg ata tgc agg tac cac caa aag gca cca ata cca ttg aat    1200  
His Lys Met Ile Cys Arg Tyr His Gln Lys Ala Pro Ile Pro Leu Asn  
385                    390                    395                    400  
gtg ctc aca act gtg cca ttg ttc ttt gcg att ggt ttc ttg gtg ggt    1248  
Val Leu Thr Thr Val Pro Leu Phe Phe Ala Ile Gly Phe Leu Val Gly  
405                    410                    415  
tat ata ctg tat ggt gca gct atg cac ata gta aaa gtc gaa gat gat    1296  
Tyr Ile Leu Tyr Gly Ala Ala Met His Ile Val Lys Val Glu Asp Asp  
420                    425                    430

ttc cat gaa atg caa gag ctt aaa gtg cga gca gaa gct gct gat gtc 1344

Phe His Glu Met Gln Glu Leu Lys Val Arg Ala Glu Ala Ala Asp Val

435

440

445

gct aaa tcg cag ttt ctt gct acc gtg tct cac gag atc agg aca cca 1392

Ala Lys Ser Gln Phe Leu Ala Thr Val Ser His Glu Ile Arg Thr Pro

450

455

460

atg aat ggc att ctc gga atg ctt gct atg ctc cta gat aca gaa cta 1440

Met Asn Gly Ile Leu Gly Met Leu Ala Met Leu Leu Asp Thr Glu Leu

465

470

475

480

agc tcg aca cag aga gat tac gct caa acc gct caa gta tgt ggt aaa 1488

Ser Ser Thr Gln Arg Asp Tyr Ala Gln Thr Ala Gln Val Cys Gly Lys

485

490

495

gct ttg att gca ttg ata aat gag gtt ctt gat cgc gcc aag att gaa 1536

Ala Leu Ile Ala Leu Ile Asn Glu Val Leu Asp Arg Ala Lys Ile Glu

500

505

510

gct gga aag ctg gag ttg gaa tca gta cca ttt gat atc cgt tca ata 1584  
Ala Gly Lys Leu Glu Leu Glu Ser Val Pro Phe Asp Ile Arg Ser Ile  
515 520 525  
ttg gat gat gtc ctt tct cta ttc tct gag gag tca agg aac aaa ggc 1632  
Leu Asp Asp Val Leu Ser Leu Phe Ser Glu Glu Ser Arg Asn Lys Gly  
530 535 540  
att gag ctc gcg gtt ttc gtt tca gac aaa gta cca gag ata gtc aaa 1680  
Ile Glu Leu Ala Val Phe Val Ser Asp Lys Val Pro Glu Ile Val Lys  
545 550 555 560  
gga gat tca ggg aga ttt aga cag ata atc ata aac ctt gtt gga aat 1728  
Gly Asp Ser Gly Arg Phe Arg Gln Ile Ile Ile Asn Leu Val Gly Asn  
565 570 575  
tcg gtt aaa ttc aca gag aaa gga cat atc ttt gtt aaa gtc cat ctt 1776  
Ser Val Lys Phe Thr Glu Lys Gly His Ile Phe Val Lys Val His Leu  
580 585 590  
gcg gaa caa tca aaa gat gaa tct gaa ccg aaa aat gca ttg aat ggt 1824

Ala Glu Gln Ser Lys Asp Glu Ser Glu Pro Lys Asn Ala Leu Asn Gly

595

600

605

gga gtg tct gaa gaa atg atc gtt gtt tcc aaa cag tca agt tac aac 1872

Gly Val Ser Glu Glu Met Ile Val Val Ser Lys Gln Ser Ser Tyr Asn

610

615

620

aca ttg agc ggt tac gaa gct gct gat ggt cgg aat agc tgg gat tca 1920

Thr Leu Ser Gly Tyr Glu Ala Ala Asp Gly Arg Asn Ser Trp Asp Ser

625

630

635

640

ttc aag cat ttg gtc tct gag gag cag tca tta tcg gag ttt gat att 1968

Phe Lys His Leu Val Ser Glu Glu Gln Ser Leu Ser Glu Phe Asp Ile

645

650

655

tct agc aat gtt agg ctt atg gtt tca atc gaa gac acg ggt att gga 2016

Ser Ser Asn Val Arg Leu Met Val Ser Ile Glu Asp Thr Gly Ile Gly

660

665

670

atc cct tta gtt gca caa ggc cgt gtg ttt atg ccg ttt atg caa gca 2064

Ile Pro Leu Val Ala Gln Gly Arg Val Phe Met Pro Phe Met Gln Ala  
675 680 685

gat agc tcg act tca aga aac tat gga ggt act ggt att ggt ttg agt 2112

Asp Ser Ser Thr Ser Arg Asn Tyr Gly Gly Thr Gly Ile Gly Leu Ser  
690 695 700

ata agc aag tgt ctt gtt gaa ctt atg cgt ggt cag ata aat ttc ata 2160

Ile Ser Lys Cys Leu Val Glu Leu Met Arg Gly Gln Ile Asn Phe Ile  
705 710 715 720

agc cgg cct cat att gga agc acg ttc tgg ttc acg gct gtt tta gag 2208

Ser Arg Pro His Ile Gly Ser Thr Phe Trp Phe Thr Ala Val Leu Glu  
725 730 735

aaa tgc gat aaa tgc agt gcg att aac cat atg aag aaa cct aat gtg 2256

Lys Cys Asp Lys Cys Ser Ala Ile Asn His Met Lys Lys Pro Asn Val  
740 745 750

gaa cac ttg cct tct act ttt aaa gga atg aaa gct ata gtt gtt gat 2304

Glu His Leu Pro Ser Thr Phe Lys Gly Met Lys Ala Ile Val Val Asp

755

760

765

gct aag cct gtt aga gct gct gtg act aga tac cat atg aaa aga ctc 2352

Ala Lys Pro Val Arg Ala Ala Val Thr Arg Tyr His Met Lys Arg Leu

770

775

780

gga atc aat gtt gat gtc gtg aca agt ctc aaa acc gct gtt gtt gca 2400

Gly Ile Asn Val Asp Val Val Thr Ser Leu Lys Thr Ala Val Val Ala

785

790

795

800

gct gct gcg ttt gaa aga aac ggt tct cct ctc cca aca aaa ccg caa 2448

Ala Ala Ala Phe Glu Arg Asn Gly Ser Pro Leu Pro Thr Lys Pro Gln

805

810

815

ctt gat atg atc tta gta gag aaa gat tca tgg att tca act gaa gat 2496

Leu Asp Met Ile Leu Val Glu Lys Asp Ser Trp Ile Ser Thr Glu Asp

820

825

830

aat gac tca gag att cgt tta ttg aat tca aga acc aac gga aac gtt 2544

Asn Asp Ser Glu Ile Arg Leu Leu Asn Ser Arg Thr Asn Gly Asn Val

835

840

845

cat cac aag tct ccg aaa cta gct cta ttc gca aca aac atc aca aat 2592

His His Lys Ser Pro Lys Leu Ala Leu Phe Ala Thr Asn Ile Thr Asn

850 855 860

tcg gag ttc gac aga gct aaa tcc gca gga ttt gca gat acg gta ata 2640

Ser Glu Phe Asp Arg Ala Lys Ser Ala Gly Phe Ala Asp Thr Val Ile

865 870 875 880

atg aaa ccg tta aga gca agc atg att ggg gcg tgt ctg caa caa gtt 2688

Met Lys Pro Leu Arg Ala Ser Met Ile Gly Ala Cys Leu Gln Gln Val

885 890 895

ctc gag ctg aga aaa aca aga caa caa cat cca gaa gga tca tca ccc 2736

Leu Glu Leu Arg Lys Thr Arg Gln Gln His Pro Glu Gly Ser Ser Pro

900 905 910

gca act ctc aag agc ttg ctt aca ggg aag aag att ctt gtg gtt gat 2784

Ala Thr Leu Lys Ser Leu Leu Thr Gly Lys Lys Ile Leu Val Val Asp

915 920 925

gat aat ata gtt aac agg aga gta gct gca gga gct ctc aag aaa ttt 2832  
Asp Asn Ile Val Asn Arg Arg Val Ala Ala Gly Ala Leu Lys Lys Phe  
930 935 940  
gga gca gaa gtg gtt tgt gca gag agt ggt caa gtt gct ttg ggt ttg 2880  
Gly Ala Glu Val Val Cys Ala Glu Ser Gly Gln Val Ala Leu Gly Leu  
945 950 955 960  
ctt cag att cca cac act ttc gat gct tgc ttc atg gat att caa atg 2928  
Leu Gln Ile Pro His Thr Phe Asp Ala Cys Phe Met Asp Ile Gln Met  
965 970 975  
cca cag atg gac gga ttt gaa gca act cgt cag ata aga atg atg gag 2976  
Pro Gln Met Asp Gly Phe Glu Ala Thr Arg Gln Ile Arg Met Met Glu  
980 985 990  
aag gaa gct aaa gag aag acg aat ctc gaa tgg cat tta ccg att cta 3024  
Lys Glu Ala Lys Glu Lys Thr Asn Leu Glu Trp His Leu Pro Ile Leu  
995 1000 1005  
gcg atg act gcg gat gtg ata cac gcg acc tac gag gaa tgt ctg aaa 3072

Ala Met Thr Ala Asp Val Ile His Ala Thr Tyr Glu Glu Cys Leu Lys

1010

1015

1020

agt ggg atg gat ggt tac gtc tcc aaa cct ttt gaa gaa gag aat ctc 3120

Ser Gly Met Asp Gly Tyr Val Ser Lys Pro Phe Glu Glu Glu Asn Leu

1025

1030

1035

1040

tat aaa tcc gtt gcc aaa tca ttc aaa cct aat cct atc tca cct tcg 3168

Tyr Lys Ser Val Ala Lys Ser Phe Lys Pro Asn Pro Ile Ser Pro Ser

1045

1050

1055

tcg taa

3174

Ser

<210> 6

<211> 1057

<212> PRT

<213> Arabidopsis thaliana

<400> 6

Met Asn Trp Ala Leu Asn Asn His Gln Glu Glu Glu Glu Pro Arg

1                    5                    10                    15

Arg Ile Glu Ile Ser Asp Ser Glu Ser Leu Glu Asn Leu Lys Ser Ser  
20                    25                    30

Asp Phe Tyr Gln Leu Gly Gly Gly Ala Leu Asn Ser Ser Glu Lys  
35                    40                    45

Pro Arg Lys Ile Asp Phe Trp Arg Ser Gly Leu Met Gly Phe Ala Lys  
50                    55                    60

Met Gln Gln Gln Gln Gln Leu Gln His Ser Val Ala Val Lys Met Asn  
65                    70                    75                    80

Asn Asn Asn Asn Asn Asp Leu Met Gly Asn Lys Lys Gly Ser Thr Phe  
85                    90                    95

Ile Gln Glu His Arg Ala Leu Leu Pro Lys Ala Leu Ile Leu Trp Ile  
100                    105                    110

Ile Ile Val Gly Phe Ile Ser Ser Gly Ile Tyr Gln Trp Met Asp Asp  
115                    120                    125

Ala Asn Lys Ile Arg Arg Glu Glu Val Leu Val Ser Met Cys Asp Gln  
130                    135                    140

Arg Ala Arg Met Leu Gln Asp Gln Phe Ser Val Ser Val Asn His Val  
145                    150                    155                    160

His Ala Leu Ala Ile Leu Val Ser Thr Phe His Tyr His Lys Asn Pro  
165                    170                    175

Ser Ala Ile Asp Gln Glu Thr Phe Ala Glu Tyr Thr Ala Arg Thr Ala  
180                    185                    190

Phe Glu Arg Pro Leu Leu Ser Gly Val Ala Tyr Ala Glu Lys Val Val  
195                    200                    205

Asn Phe Glu Arg Glu Met Phe Glu Arg Gln His Asn Trp Val Ile Lys

210                    215                    220  
Thr Met Asp Arg Gly Glu Pro Ser Pro Val Arg Asp Glu Tyr Ala Pro  
225                    230                    235                    240  
Val Ile Phe Ser Gln Asp Ser Val Ser Tyr Leu Glu Ser Leu Asp Met  
245                    250                    255  
Met Ser Gly Glu Glu Asp Arg Glu Asn Ile Leu Arg Ala Arg Glu Thr  
260                    265                    270  
Gly Lys Ala Val Leu Thr Ser Pro Phe Arg Leu Leu Glu Thr His His  
275                    280                    285  
Leu Gly Val Val Leu Thr Phe Pro Val Tyr Lys Ser Ser Leu Pro Glu  
290                    295                    300  
Asn Pro Thr Val Glu Glu Arg Ile Ala Ala Thr Ala Gly Tyr Leu Gly  
305                    310                    315                    320  
Gly Ala Phe Asp Val Glu Ser Leu Val Glu Asn Leu Leu Gly Gln Leu  
325                    330                    335  
Ala Gly Asn Gln Ala Ile Val Val His Val Tyr Asp Ile Thr Asn Ala  
340                    345                    350  
Ser Asp Pro Leu Val Met Tyr Gly Asn Gln Asp Glu Glu Ala Asp Arg  
355                    360                    365  
Ser Leu Ser His Glu Ser Lys Leu Asp Phe Gly Asp Pro Phe Arg Lys  
370                    375                    380  
His Lys Met Ile Cys Arg Tyr His Gln Lys Ala Pro Ile Pro Leu Asn  
385                    390                    395                    400  
Val Leu Thr Thr Val Pro Leu Phe Phe Ala Ile Gly Phe Leu Val Gly  
405                    410                    415  
Tyr Ile Leu Tyr Gly Ala Ala Met His Ile Val Lys Val Glu Asp Asp

420                    425                    430

Phe His Glu Met Gln Glu Leu Lys Val Arg Ala Glu Ala Ala Asp Val

435                    440                    445

Ala Lys Ser Gln Phe Leu Ala Thr Val Ser His Glu Ile Arg Thr Pro

450                    455                    460

Met Asn Gly Ile Leu Gly Met Leu Ala Met Leu Leu Asp Thr Glu Leu

465                    470                    475                    480

Ser Ser Thr Gln Arg Asp Tyr Ala Gln Thr Ala Gln Val Cys Gly Lys

485                    490                    495

Ala Leu Ile Ala Leu Ile Asn Glu Val Leu Asp Arg Ala Lys Ile Glu

500                    505                    510

Ala Gly Lys Leu Glu Leu Glu Ser Val Pro Phe Asp Ile Arg Ser Ile

515                    520                    525

Leu Asp Asp Val Leu Ser Leu Phe Ser Glu Glu Ser Arg Asn Lys Gly

530                    535                    540

Ile Glu Leu Ala Val Phe Val Ser Asp Lys Val Pro Glu Ile Val Lys

545                    550                    555                    560

Gly Asp Ser Gly Arg Phe Arg Gln Ile Ile Ile Asn Leu Val Gly Asn

565                    570                    575

Ser Val Lys Phe Thr Glu Lys Gly His Ile Phe Val Lys Val His Leu

580                    585                    590

Ala Glu Gln Ser Lys Asp Glu Ser Glu Pro Lys Asn Ala Leu Asn Gly

595                    600                    605

Gly Val Ser Glu Glu Met Ile Val Val Ser Lys Gln Ser Ser Tyr Asn

610                    615                    620

Thr Leu Ser Gly Tyr Glu Ala Ala Asp Gly Arg Asn Ser Trp Asp Ser

625                    630                    635                    640  
Phe Lys His Leu Val Ser Glu Glu Gln Ser Leu Ser Glu Phe Asp Ile  
645                    650                    655  
Ser Ser Asn Val Arg Leu Met Val Ser Ile Glu Asp Thr Gly Ile Gly  
660                    665                    670  
Ile Pro Leu Val Ala Gln Gly Arg Val Phe Met Pro Phe Met Gln Ala  
675                    680                    685  
Asp Ser Ser Thr Ser Arg Asn Tyr Gly Gly Thr Gly Ile Gly Leu Ser  
690                    695                    700  
Ile Ser Lys Cys Leu Val Glu Leu Met Arg Gly Gln Ile Asn Phe Ile  
705                    710                    715                    720  
Ser Arg Pro His Ile Gly Ser Thr Phe Trp Phe Thr Ala Val Leu Glu  
725                    730                    735  
Lys Cys Asp Lys Cys Ser Ala Ile Asn His Met Lys Lys Pro Asn Val  
740                    745                    750  
Glu His Leu Pro Ser Thr Phe Lys Gly Met Lys Ala Ile Val Val Asp  
755                    760                    765  
Ala Lys Pro Val Arg Ala Ala Val Thr Arg Tyr His Met Lys Arg Leu  
770                    775                    780  
Gly Ile Asn Val Asp Val Val Thr Ser Leu Lys Thr Ala Val Val Ala  
785                    790                    795                    800  
Ala Ala Ala Phe Glu Arg Asn Gly Ser Pro Leu Pro Thr Lys Pro Gln  
805                    810                    815  
Leu Asp Met Ile Leu Val Glu Lys Asp Ser Trp Ile Ser Thr Glu Asp  
820                    825                    830  
Asn Asp Ser Glu Ile Arg Leu Leu Asn Ser Arg Thr Asn Gly Asn Val

835                    840                    845  
His His Lys Ser Pro Lys Leu Ala Leu Phe Ala Thr Asn Ile Thr Asn  
850                    855                    860  
Ser Glu Phe Asp Arg Ala Lys Ser Ala Gly Phe Ala Asp Thr Val Ile  
865                    870                    875                    880  
Met Lys Pro Leu Arg Ala Ser Met Ile Gly Ala Cys Leu Gln Gln Val  
885                    890                    895  
Leu Glu Leu Arg Lys Thr Arg Gln Gln His Pro Glu Gly Ser Ser Pro  
900                    905                    910  
Ala Thr Leu Lys Ser Leu Leu Thr Gly Lys Lys Ile Leu Val Val Asp  
915                    920                    925  
Asp Asn Ile Val Asn Arg Arg Val Ala Ala Gly Ala Leu Lys Lys Phe  
930                    935                    940  
Gly Ala Glu Val Val Cys Ala Glu Ser Gly Gln Val Ala Leu Gly Leu  
945                    950                    955                    960  
Leu Gln Ile Pro His Thr Phe Asp Ala Cys Phe Met Asp Ile Gln Met  
965                    970                    975  
Pro Gln Met Asp Gly Phe Glu Ala Thr Arg Gln Ile Arg Met Met Glu  
980                    985                    990  
Lys Glu Ala Lys Glu Lys Thr Asn Leu Glu Trp His Leu Pro Ile Leu  
995                    1000                  1005  
Ala Met Thr Ala Asp Val Ile His Ala Thr Tyr Glu Glu Cys Leu Lys  
1010                  1015                  1020  
Ser Gly Met Asp Gly Tyr Val Ser Lys Pro Phe Glu Glu Asn Leu  
1025                  1030                  1035                  1040  
Tyr Lys Ser Val Ala Lys Ser Phe Lys Pro Asn Pro Ile Ser Pro Ser

1045

1050

1055

Ser

<210> 7

<211> 125

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 7

Glu Thr Ser Val Lys Ile Leu Val Val Glu Asp Asn His Val Asn Gln

1

5

10

15

Glu Val Ile Lys Arg Met Leu Asn Leu Glu Gly Ile Glu Asn Ile Glu

20

25

30

Leu Ala Cys Asp Gly Gln Glu Ala Phe Asp Lys Val Lys Glu Leu Thr

35

40

45

Ser Lys Gly Glu Asn Tyr Asn Met Ile Phe Met Asp Val Gln Met Pro

50

55

60

Lys Val Asp Gly Leu Leu Ser Thr Lys Met Ile Arg Arg Asp Leu Gly

65

70

75

80

Tyr Thr Ser Pro Ile Val Ala Leu Thr Ala Phe Ala Asp Asp Ser Asn  
85 90 95

Ile Lys Glu Cys Leu Glu Ser Gly Met Asn Gly Phe Leu Ser Lys Pro  
100 105 110

Ile Lys Arg Pro Lys Leu Lys Thr Ile Leu Thr Glu Phe  
115 120 125

<210> 8  
<211> 118  
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<213> Escherichia coli

<400> 1  
Asn Asp Asp Met Met Ile Leu Val Val Asp Asp His Pro Ile Asn Arg  
1 5 10 15

Arg Leu Leu Ala Asp Gln Leu Gly Ser Leu Gly Tyr Gln Cys Lys Thr  
20 25 30

Ala Asn Asp Gly Val Asp Ala Leu Asn Val Leu Ser Lys Asn His Ile  
35 40 45

Asp Ile Val Leu Ser Asp Val Asn Met Pro Asn Met Asp Gly Tyr Arg

50

55

60

Leu Thr Gln Arg Ile Arg Gln Leu Gly Leu Thr Leu Pro Val Ile Gly

65

70

75

80

Val Thr Ala Asn Ala Leu Ala Glu Glu Lys Gln Arg Cys Leu Glu Ser

85

90

95

Gly Met Asp Ser Cys Leu Ser Lys Pro Val Thr Leu Asp Val Ile Lys

100

105

110

Gln Ser Leu Thr Leu Tyr

115

<210> 9

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<212> DNA

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<220>

<223> Description of Artificial Sequence:Designed

oligonucleotide primer for PCR

<400> 9

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32

<210> 10

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Designed  
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<210> 11

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Designed  
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<400> 11

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24

<210> 12

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Designed  
oligonucleotide primer for PCR

<400> 12

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24

<210> 13

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Designed

oligonucleotide primer for PCR

<400> 13

accatgaact gggcactcaa caatcatcaa g

31

<210> 14

<211> 30

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:Designed

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<400> 14

ggattacgac gaaggtgaga taggattagg

30

<210> 15

<211> 32

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:Designed  
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<400> 15

gatcccagct agcttagggcc ctaccgcggg ga 32

<210> 16

<211> 32

<212> DNA

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<400> 16

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<210> 17

<211> 33

<212> DNA

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<400> 17

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<210> 18

<211> 32

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<223> Description of Artificial Sequence:Designed  
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<400> 18

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<210> 19

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<400> 19

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31

<210> 20

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<400> 20

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33

<210> 21

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<212> DNA

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<223> Description of Artificial Sequence:Designed

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<400> 21

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33

<210> 22

<211> 32

<212> DNA

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32